



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/579,658

02/05/2007

Donald James Highgate

GJE.7649

9394

23557 7590 06/24/2010
SALIWANCHIK LLOYD & SALIWANCHIK
A PROFESSIONAL ASSOCIATION
PO Box 142950
GAINESVILLE, FL 32614

EXAMINER

APICELLA, KARIE O

ART UNIT

PAPER NUMBER

1795

NOTIFICATION DATE

DELIVERY MODE

06/24/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

euspto@slspatents.com

Office Action Summary	Application No. 10/579,658	Applicant(s) HIGHGATE, DONALD JAMES	
	Examiner Karie O'Neill Apicella	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,6,9-11 and 13-21 is/are pending in the application.
- 4a) Of the above claim(s) 15-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,6,9-11, 13 and 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The Applicant's amendment filed on March 31, 2010. Claim 1 has been amended. Claims 2-5, 7-8 and 12 have been cancelled. Claims 15-21 have been added as new and are withdrawn from consideration through election by original presentation. Therefore, Claims 1, 6, 9-11 and 13-14 are pending in this office action.

Election/Restrictions

2. Newly submitted Claims 15-21 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The subject matter of the aforementioned claims is drawn to "a method of performing an electrochemical reaction in which water is converted into hydrogen and oxygen, in an electrochemical cell comprising electrodes separated by a hydrophilic membrane which is ionically inactive or weakly ionically active, wherein the reaction is conducted in the presence of an aqueous solution of an electrolyte of which *the concentration is controlled by introducing water into the cell*", which is a distinct species from "a method of performing an electrochemical reaction in which hydrogen and oxygen are converted into water, in an electrochemical cell comprising electrodes separated by a hydrophilic ion exchange membrane which is ionically inactive or weakly ionically active, wherein the reaction is conducted in the presence of an aqueous solution of an electrolyte of which *the concentration is controlled by removing water from the membrane*", as recited in the original claim.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, Claims 15-21 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 112

3. The rejection of Claim 7 under 35 U.S.C. 112, second paragraph, has been overcome based on the amendments to the claims and the arguments presented on page 5 of the Remarks dated March 31, 2010.

Claim Rejections - 35 USC § 102

4. The rejection of Claims 1-8 and 12-14 under 35 U.S.C. 102(b) as being anticipated by Hilmer (US 3,492,163), has been overcome based on the amendments to the claims and the arguments presented on page 6 of the Remarks dated March 31, 2010.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 1795

6. Claims 1, 6, 9, 13 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Bushnell (US 3,748,179).

With regard to Claim 1, Bushnell discloses a method of performing an electrochemical reaction in which hydrogen and oxygen are converted into water (column 1, lines 70-71), in an electrochemical cell comprising electrodes (5,7) separated by a hydrophilic matrix or membrane (6) which is ionically inactive or weakly ionically active (column 3, lines 17-19; column 4, lines 1-4), wherein the reaction is conducted in the presence of an aqueous solution of an electrolyte (column 3, lines 44-65) of which the concentration of electrolyte is controlled by removing excess air and impurities, such as water which is a natural byproduct of the reaction between hydrogen and air, from the matrix (6) or membrane, which has a constant flow of electrolyte coursing through it (column 3, lines 44-65).

With regard to Claim 6, Bushnell discloses wherein the electrolyte is potassium hydroxide (column 3, lines 44-45), as well as other commonly employed aqueous electrolytes exemplified by aqueous solution of the alkali hydroxides, alkaline earth hydroxides, and carbonates, as well as strong acid electrolytes (column 4, lines 20-25).

With regard to Claim 9, Bushnell discloses wherein the hydrophilic material of the matrix (6) is a polymeric material (column 4, lines 1-4).

With regard to Claim 13, Bushnell discloses wherein the cell in the form of a membrane electrode assembly, or stack of MEAs (column 3, lines 17-19).

Art Unit: 1795

With regard to Claim 14, Bushnell discloses wherein the concentration is controlled by the addition of further electrolyte, as a result of the capillary forces which exchange electrolyte within the matrix (column 3, lines 49-54).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bushnell (US 3,748,179), as applied to Claims 1, 6, 9, 13 and 14 above, and in further view of Naito et al. (US 3,925,332).

Bushnell discloses the method of performing an electrochemical reaction in an electrochemical cell comprising electrodes separated by a hydrophilic matrix or membrane, made up of a asbestos or other hydrophilic matrices including ceramic metal and polymeric materials, but does not specifically disclose wherein the hydrophilic material is obtainable by the polymerization of monomers including methyl methacrylate, N-vinyl-2- pyrrolidone or acrylonitrile and wherein the hydrophilic material is cross-linked.

Naito et al. discloses a hydrophilic membrane for use in a fuel cell of the hydrogen-oxygen type wherein an alkaline electrolyte and ion-exchange membrane are used (column 7, lines 33-46). Naito et al. discloses wherein the hydrophilic membrane is

Art Unit: 1795

prepared by sulfonating a substrate of a polymeric composition comprising a copolymer of ethylene copolymerized with 3.0 to 18.0 mole % of a comonomer of the formula:



wherein R_1 is hydrogen or a methyl group, R_2 is an alkyl group with 1 to 5 carbon atoms and R_3 is hydrogen or an alkyl group with 1 to 6 carbon atoms, or an ionically crosslinked derivative thereof (only when R_3 is hydrogen). Typical examples of the copolymer include ethylene-methyl methacrylate (column 2, lines 6-26). At the time of the invention it would have been obvious to one of ordinary skill in the art to use a polymeric material of a polymerized methyl methacrylate monomer and an ionically crosslinked derivative as the hydrophilic material of the membrane of Bushnell, because Naito et al. teaches that the hydrophilic membrane obtained is endowed with excellent hydrophilic properties, ion-exchange capacity and electrochemical properties which are permanent in nature, as well as, little degradation in other physical properties and resistance to acids and alkalis (column 4, lines 60-67).

Response to Arguments

Art Unit: 1795

9. Applicant's arguments with respect to claims 1, 6, 9-11 and 13-14 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues with respect to Naito et al., "a skilled artisan would not have had any reason to replace the membrane in Naito et al. by one which is ionically inactive or weakly ionically active, as required by the claimed invention. In fact, Naito et al. effectively teach away from such a membrane by requiring an ionic species as part of the membrane."

The term "weakly ionically active" is a relative term that is not defined by the claim, and the specification does not provide a standard for ascertaining the requisite degree. Therefore, ionic activity can be present to a degree in the materials of the membrane.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 1795

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill Apicella whose telephone number is (571) 272-8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795

Karie O'Neill Apicella
Examiner
Art Unit 1795

KOA

Application/Control Number: 10/579,658
Art Unit: 1795

Page 9